In the claims:

1–9. (canceled)

10. (currently amended) A PCB decomposition reactor comprising:

(a) a reaction vessel for decomposing PCB therein;**[[and]]**

(b) a cyclone separator disposed in flow communication with an outlet of said reaction vessel for separating sodium carbonate particles from a reaction fluid withdrawn through said outlet, wherein said outlet is formed in a sidewall of said reaction vessel, said reaction vessel being equipped with an injector connected thereto for injecting water and sodium hydroxide from the outside to the inside of said reaction vessel, and a pipe connected to a suction chamber of said injector for introducing the sodium carbonate particles separated by said cyclone separator into the said suction chamber, said injector comprising a suction port; and

(c) a feed pipe for feeding PCB and a solvent therefore to said reaction vessel, ~~wherein an injector for injecting water and sodium hydroxide from the outside to the inside of said reaction vessel is connected to said reaction vessel, said injector comprising a suction port,~~ wherein said feed pipe is connected to a flow path between an end of said injector connected to said reaction vessel and the suction port of said injector for supplying water and sodium hydroxide therethrough such that the pH in the reaction vessel is from about pH 7.5 to about pH 13, wherein the sodium hydroxide is supplied to said reaction vessel in an amount of about 1 to about 2 moles per mole of PCB in order to form sodium carbonate so as to fall within a range which does not cause any excess sodium carbonate to precipitate, and wherein a nozzle for introducing air in order to agitate the reaction fluid within said reaction vessel is connected to the bottom of said reaction vessel.

11. (currently amended) A PCB decomposition reactor comprising:

(a) a reaction vessel for decomposing PCB therein; and

(b) a cyclone separator disposed in flow communication with an outlet of said reaction vessel for separating sodium carbonate particles from a reaction fluid withdrawn through said outlet, wherein said outlet is formed in a sidewall of said reaction vessel, said reaction vessel being equipped with an injector connected thereto for injecting water and

sodium hydroxide from the outside to the inside of said reaction vessel, and a pipe connected to a suction chamber of said injector for introducing the sodium carbonate particles separated by said cyclone separator into the said suction chamber, said injector comprising a suction port; and

(c) a feed pipe for feeding PCB and a solvent therefore to said reaction vessel, ~~wherein an injector for injecting water and sodium hydroxide from the outside to the inside of said reaction vessel is connected to said reaction vessel, said injector comprising a suction port,~~ wherein said feed pipe is connected to a flow path between an end of said injector connected to said reaction vessel and the suction port of said injector for supplying water and sodium hydroxide therethrough such that the pH in the reaction vessel is from about pH 7.5 to about pH 13, wherein the sodium hydroxide is supplied to said reaction vessel in an amount of about 1 to about 2 moles per mole of PCB in order to form sodium carbonate so as to fall within a range which does not cause any excess sodium carbonate to precipitate, and wherein a nozzle for introducing air in order to agitate the reaction fluid within said reaction vessel is connected to the bottom of said reaction vessel.

12. (currently amended) A PCB decomposition reactor comprising:

(a) a reaction vessel for decomposing PCB therein;

(b) a cyclone separator disposed in flow communication with an outlet of said reaction vessel for separating sodium carbonate particles from a reaction fluid withdrawn through said outlet, wherein said outlet is formed in a sidewall of said reaction vessel, said reaction vessel being equipped with an injector connected thereto for injecting water and sodium hydroxide from the outside to the inside of said reaction vessel, and a pipe connected to a suction chamber of said injector for introducing the sodium carbonate particles separated by said cyclone separator into the said suction chamber, said injector comprising a suction port; and

(c) a feed pipe for feeding PCB and a solvent therefore to said reaction vessel, ~~wherein an injector for injecting water and sodium hydroxide from the outside to the inside of said reaction vessel is connected to said reaction vessel, said injector comprising a suction port,~~ wherein said feed pipe is connected to a flow path between an end of said injector connected to said reaction vessel and the suction port of said injector for supplying water and sodium hydroxide therethrough such that the pH in the reaction vessel is from about pH 7.5 to

about pH 13, wherein the sodium hydroxide is supplied to said reaction vessel in an amount of about 1 to about 2 moles per mole of PCB in order to form sodium carbonate so as to fall within a range which does not cause any excess sodium carbonate to precipitate, and wherein a nozzle for introducing air in order to agitate the reaction fluid within said reaction vessel is connected to the bottom of said reaction vessel.

13–16. (canceled)